

MARSHAK, M.S., prof. (Moskva)

Milk in the diet of the healthy and the sick. Fel'd. i akush. 25
no.8:17-21 Ag '60. (MIRA 13:8)
(MILK)

MARSHAK, Maks Solomonovich, doktor med. nauk; GREKULOVA, A.L., red.;
NEKHLIYUDOVA, A.S., red.; NAZAROVA, A.S., tekhn. red.

[Proper diet for the individual] Kak nado pitat'sia. Moskva,
Izd-vo "Znanie," 1961. 39 p. (Narodnyi universitet Kul'tury:
Estestvennonauchnyi fakul'tet, no.22) (MIRA 15:1)
(DIET)

MOLCHANOVA, O.P., prof.; LOBANOV, D.I., prof.; MARSHAK, M.S., prof.;
GANETSKIY, I.D.; BEREZIN, N.I., laureat Stalinskoy premii;
KONNIKOV, A.G., laureat Stalinskoy premii; LIPSHITS, M.O.;
MEPLITSKIY, L.V., doktor sel'skokhoz.nauk; NAMESTNIKOV, A.F.,
kand.tekhn.nauk. Prinimali uchastiye: ANAN'YEV, A.A.; GROZNOV,
S.R.; YEFIMOV, V.P.; KIKNADZE, N.S.; NIKASHIN, F.P.; PIROGOV,
N.M.; SKRIPKIN, G.M.; TSYPLENKOV, N.P. SIVOLAP, I.K., red.;
SKURIKHIN, M.A., red.; BETSOFFEN, Ya.I., red.; DAMASKINA, G.B.,
red.; PRITYKINA, L.A., red.; KISINA, Ye.I., tekhn.red.

[Book on tasty and healthy food] Kniga o vkusnoi i zdorovoi
pishche. Moskva, Pishchepromizdat, 1961. 423 p.

(MIRA 15:2)

1. Chlen-korrespondent AMN SSSR (for Molchanova).
(Cookery)

MARSHAK

MARCHAK, M. S. (USSR)

"Les principes de l'organisation de la therapeutique alimentaire
en USSR"

Paper presented at the Third International Congress of Dietetics,
London, 10-14 July 1961.

MARSHAK, M., prof.

Diet of an adult. Obshchestv. pit. no. 2: 39-40 F '61. (MIRA 14:3)
(Diet)

MARSHAK, M.S., prof.

Some advice for thin people. Zdorov'e 7 no.12:20-21 D '61.
(MIRA 14:12)

(DIET)

MARSHAK, M.S., prof.

Is herring good for everyone? Zdorov'e 7 no. 2:31 F '61.

(MIRA 14:2)

(HERRING)

MARSHAK, M.S., prof.

Laminaria saccharina. Zdorov'e 7 no.7:30 JI '61. (MIRA 14:6)
(~~SEAWEED~~—THERAPEUTIC USE)

MARSHAK, M.S., prof.

Cottage cheese dieting days. Zdorov'e 8 no.9:28 S '62. (MIRA 15:9)
(DIET)

KOSILOV, S.A., prof.; MARSHAK, M.S., prof.

Rhythm, shift, and regimen. Zdorov'e 8 no.12:4-6 D '62.

(MIRA 16:1)

(INDUSTRIAL HYGIENE)

SKEP'YAN, N.A., vrach; MELOKS, T.S., vrach; SIDEL'NIKOVA, T.Ya., kand.
med.nauk; GUNDOROVA, R.A., kand.med.nauk; KRISTMAN, V.I., kand.
med.nauk; GUSAROVA, A.S., kand.med.nauk; MARSHAK, M.S., prof.

How to keep well. Zdorov'e 8 no.12:28-29 D '62. (MIRA 16:1)
(HYGIENE)

MARSHAK, Maks Solomonovich, prof.; KRYUKOVA, S.N., red.;
ATROSHCHENKO, L.Ye., tekhn. red.

[Vitamins and health] Vitaminy i zdorov'e. Moskva, Izd-
vo "Znanie," 1963. 39 p. (Narodnyi universitet kul'tury:
Fakul'tet zdorov'ia. no.10) (MIRA 17:1)

MARSHAK, M., prof.

Occupation and nutrition. Okhr. truda i sots. strakh. no.4:
16-19 Ap '63. (MIRA 16:4)

(Labor and laboring classes)
(Nutrition)

MARSHAK, M.S., prof.

Diet for those working with harmful substances. Sov. prof-
soiuzy 20 no.4:48 F '64. (MIRA 17:3)

MARSHAK, M. E.

"The Vascular Reaction of the Skin as an Index of Adaptation to Cold Stimuli,"
Zhur. Fiz., Vol. 28, No. 2/3, pp 223-230, 1940

"Dynamics of the Temperature Changes in Different Organs upon Local Irradiation
with Ultra-Violet Rays," ibid., pp 231-234, 1940

Laboratory of Climatic Physiology (Head: Prof. M.E.Marshak), VIEM

MARSHAK, M. E.

The regulation of respiration, blood circulation and interchange of gases; collected works of the laboratory for the study of respiration and blood circulation. Moskva, Izd. Akad. nauk SSSR, 1945. 24, (2) p. (Akademiia meditsinskikh nauk SSSR, Institut fiziologii,

MARSHAK M. Ye.

5828. Present state of the problem of regulation of respiration in man *Uspechi Sovremen. Biol. Mosk.* 1950, 30/2 (161-175) Graphs 6

There is a lack of correlation between the increase of pulmonary ventilation in muscular work and the alveolar CO_2 or the pH of the arterial blood. The volume and rhythm of pulmonary ventilation is not essentially changed when the blood supply to the working muscles is cut off by means of a pressure cuff. After training, the pulmonary ventilation is greater during the first minute of 10-min. work spells than during 1-min. spells of the same type of work. During a prolonged training to work with rhythmically changing work load, produced by changing the friction of a bicycle ergometer, the pulmonary ventilation adapts to the periodic changes of the load. However, these cycles are maintained when a constant work load follows. In training to various types of exercise, a gradual synchronization between body movements and respiration develops. Once established, this association cannot be easily broken by voluntary effort, or only at the expense of motor coordination. The time of voluntary breath-holding could be prolonged by 15 to 20 sec. by the act of swallowing; this prolongation was not paralleled by any regressive change of alveolar O_2 or CO_2 . The work performance with the finger ergograph was increased by positive pressure breathing. Voluntary hyperventilation does not regularly produce a period of apnoea. The maximum duration of breath-holding can be considerably prolonged by training, in spite of the progressive decrease and increase of alveolar O_2 . It is concluded that the

(Cont'd)

MARSHAK M. E. (Cont'd)

5828. pulmonary ventilation is regulated by means of nervous, primarily cortical mechanisms, and that chemical regulation plays only a minor role. This view is supported by the results obtained by other Russian authors, and is opposed by all non-Russian authors, as quoted in the article. It is claimed that the non-Russian authors have misinterpreted experimental data.

Simonson - Minneapolis

SO: Excerpta Medica
Section II Vol. 4 No. 11

MARSHAK, M. Ye.

~~SECRET~~
Role of the cerebral cortex in regulation of respiration in man.
Probl. tuberk., Moskva no.4:8-14 July-Aug 1951. (CIML 21:1)

1. Professor, Honored Worker in Science.

MARSHAK, M. Ye., Prof.

"Physiological Principles for Toughening the Organism" *Serija i Ilustracija*
Moscow, Sept 1952, pp. 32-33
Translation: M-122, 14 Sept 53

MARSHAK, M. Y.

Chemical Abstracts.
Vol. 48
Apr. 10, 1954
Biological Chemistry

2
①
Mechanism of nerve control in relations between blood supply and aeration in human lungs. M. Y. Marshak. *Uspekhi Sovremennoi Biol.* 36, 200-26 (1953). -- Evidences of correlations between blood supply and aeration include blood O₂ data and analyses of alveolar air for O₂ and CO₂. 23 ref. Julian F. Smith.

RLH

9-2 4-1

MARSHAK, M.Ye.; MAYEVA, T.A.

Effect of moderate lowering of partial oxygen pressure on human
respiration during muscular work. Vop.kur.fizioter. i lech.fiz.kul't.
21 no.4:70-76 O-D '56. (MLRA 9:12)

1. Iz Instituta normal'noy i patologicheskoy fiziologii Akademii
meditsinskikh nauk SSSR (dir. - deystvitel'nyy chlen Akademi
meditsinskikh nauk SSSR prof V.N.Chernigovskiy)

(RESPIRATION)

(ATMOSPHERIC PRESSURE--PHYSIOLOGICAL EFFECT)

(WORK)

MARSHAK, M.Ye.

Piezometer for pulse registration in the vessels of the fingers
and of the ear lobe. Biul.eksp.biol.med. 41 no.5:75-77 May '56.

(MLRA 9:8)

1. Iz Instituta normal'noy i patologicheskoy fiziologii AMN SSSR
(dir. deystvitel'nyy chlen AMN SSSR prof. V.N.Chernigovskiy),
Moskva. Predstavlena deystvitel'nyy chlenom AMN SSSR V.N.Chernigovskiy.
(PULSE

digital & ear lobe, registration with piezometer)

MARSHAK, M.Ye.; MAYEVA, T.A.

Manifestations of hypoxia during muscular activity. Biul. eksp.
biol.med. 42 no.6:13-15 Je '56. (MIRA 9:9)

1. Iz laboratorii fiziologii i patologii dykhaniya i krovoobrashcheniya
(zav. - prof. M.Ye.Marshak) Instituta normal'noy patologicheskoy
fiziologii (dir. deystvitel'nyy chlen AMN SSSR prof. V.N.Chernigovskiy)
Moskva. Predstavlena deystvitel'nyy chlenom AMN SSSR V.N.Chernigovskim.

(BLOOD

oxygen content decrease caused by musc. activity in
beginning of work)

(OXYGEN, in blood

content decrease caused by musc. activity in beginning
of work)

(MUSCLES, physiol.

eff. of activity on oxygen content in blood in beginning
of work)

(WORK, physiol.

oxygen content decrease in blood in beginning of work,
caused by musc. activity)

USSR/ Human and Animal Physiology - Blood Circulation.

1-5

Abs Jour : Ref Zhur - Biol., No 7, 1958, 31728

Author : Marshak, M.Ye., Rogachev, V.G.

Inst : -

Title : Phototransmitters for Pulse Registration.

Orig Pub : Byul. ekspeim. biol. i meditsiny, 1956, 42, No 12, 70-71.

Abstract : Two photo transmitters for pulse registration of the ear and on the finger were constructed by the authors. The ear transmitter can be fixed on both the shell and the lobe. Its weight is 8-10 g. The transmitter for the finger can be secured on the end phalanx of a finger of any size.

Card 1/1

MARSHAK, MOISEY YEFIMOVICH

N/5
033.5
.E3

Fiziologicheskiye Osnovy Zakalivaniya Organizma Cheloveka (Physiological Principles
in the hardening of human organism) Moskva, Medits. 1957.

126, (2) p. Diags., Tables.

"Literatura": p. 121-126.

USSR / Human and Animal Physiology. Blood Circulation. T
The Heart.

Abs Jour: Ref Zhur-Biol., No 22, 1958, 101824.

Author : Marshak, M. Ye.; Aronova, G. N.

Inst : Not given.

Title : An Experimental Study of Coronary Blood Circulation in Dogs Without Narcosis.

Orig Pub: Byul. eksperim. biol. i med., 1957, No 1, prilozheniye, 3-5.

Abstract: In dogs without narcosis, in the course of 6 weeks, blood circulation (BC) in a closed circumflex branch of the left coronary artery was registered by the thermoelectric method. Seven days after implantation of the thermoelectrode, a full restoration of cardiac activity took place; the fluctuations of BC were negligible. Intake of food in-

Card 1/2

USSR / Human and Animal Physiology. Blood Circulation. T
The Heart.

Abs Jour: Ref Zhur-Biol., No 22, 1958, 101824.

Abstract: duced an increased velocity of BC, which lasted several minutes after food intake. Inhalation of a mixture with 2-3% of CO₂, inflation of rectum, static loading (5-8 kg) and sharp excitement (showing a cat) led to an increase of BC which lasted for several minutes after termination of the influence. Pain stimulation (single and repeated) of the hind extremity with electric current induced a short-lived lowering of BC, which was replaced by its increase. -- G. A. Levitina.

Card 2/2

31

MARSHAK, M.Ye., professor, zasluzhennyy deyatel' nauki.

Are drafts harmful? Zdorov'e 3 no.4:25 Ap '57 (MLRA 10:5)
(COLD--PHYSIOLOGICAL EFFECT)

MARSHAK, M.Ye.

Flat thermoelectrode [with summary in English] Biul.eksp.biol. i med.
43 no.1:121-122 Ja '57. (MIRA 10:8)

1. Iz laboratorii fiziologii i patologii dykhaniya i krovoobrashche-
niya Instituta normal'noy i patologicheskoy fiziologii (dir. -
deystvitel'nyy chlen AMN SSSR V.N.Chernigovskiy) AMN SSSR, Moskva.
Predstavlena deystvitel'nyy chlenom AMN SSSR V.N.Chernigovskim
(BLOOD CIRCULATION,
registration with Noyons flat thermoelectrode
simultaneously in various organs (Rus))

MARSHAK, M.Ye.; ARONOVA, G.N.

Experience in studying coronary circulation in dogs without anesthesia. Biul.eksp.biol. i med. 43 no.1 supplement:3-5 '57.

(MIRA 10:3)

1. Iz laboratorii fiziologii i patologiidykhaniya i krovoobrashcheniya (zav. zasluzhennyi deyatel' nauki prof. M.Ye.Marshak) Instituta normal'noy i patologicheskoy fiziologii (dir. - deystvitel'nyy chlen AMN SSSR prof. V.N.Chernigovskiy) AMN SSSR. Predstavlena deystvitel'-nym AMN SSSR V.N.Chernigovskim.

(HEART, blood supply

coronary circ. study in dogs without anesth., methods)

~~MARSHAK, M.Ye., prof.~~

Current status of the problems of the regulation of respiration in man
Vest.AMN SSSR 13 no.8:9-19 '58 (MIRA 11:8)

1. Laboratoriya fiziologii i patologii dykhaniya i krovoobrashcheniya
Instituta normal'noy i patologicheskoy fiziologii AMN SSSR. Chlen-
korrespondent AMN SSSR.

(RESPIRATION, physiol.
regulation (Rus))

MARSHAK, M.Ye., ARONOVA, G.N.

Method for investigating coronary circulation in dogs in long-term experiments. *Fiziol.zhur.* 44 no.8:770-773 Ag '58 (MIRA 11:9)

1. Laboratoriya fiziologii i patologii dykhaniya i krovoobrashcheniya Instituta normal'noy i patologicheskoy fiziologii AMN SSSR, Moskva.
(CORONARY VESSELS, physiology,
circ., determ. in dogs in chronic exper. (Rus))

MARSHAK, M.Ye., prof.

Some features of the regulation of regional blood circulation. Vest.
AMN SSSR 14 no.9:36-47 '59. (MIRA 13:1)

1. Laboratoriya fiziologii i patologii dykhaniya i krovoobrachcheniya
Instituta normal'noy i patologicheskoy fiziologii AMN SSSR. 2. Cheln-
korrespondent AMN SSSR (for Marshak).
(BLOOD CIRCULATION physiol.)

MARSHAK, Moisey Yefimovich; KANDROR, I.S., red.; GABERLAND, M.I., tekhn.
red.

[Regulation of respiration in man] Regulatsiia dykhaniia u che-
loveka. Moskva, Gos. izd-vo med. lit-ry Medgiz, 1961. 265 p.
(MIRA 14:7)

(RESPIRATION)

MARSHAK, M.Ye., prof.

Do you know how to breathe? *Zdorov'e* 7 no.7:9-11 J1 '61.

(MIRA 14:6)

1. Chlen-korrespondent Akademii meditsinskikh nauk SSSR.
(RESPIRATION)

MARSHAK, M.Ye.; MAYEVA, T.A.

Effect of hypocapnia on the functional state of the respiratory center. Fiziol.zhur. 47 no.2:191-195 F '61. (MIRA 14:5)

1. From the Laboratory of Physiology and Pathology of Respiration and Blood Circulation. Institute of Normal and Pathogenic Physiological, Moscow.
(CARBON DIOXIDE) (MEDULLA OBLONGATA)

MARSHAK, M. Ye.

Materials on the functional organization of the respiratory
and vasomotor centers. Trudy Inst. norm. i pat. fiziol. AMN
SSSR 6:28-30 '62 (MIRA 17:1)

1. Laboratoriya fiziologii i patologii krovoobrashcheniya
(zav. - chlen-korrespondent AMN SSSR prof. M.Ye. Marshak)
Instituta normal'noy i patologicheskoy fiziologii AMN SSSR.

MARSHAK, M.Ye.

Data on the functional organization of the respiratory center.
Vest.AMN SSSR 17 no.8:16-22 '62. (MIRA 15:12)

1. Laboratoriya fiziologii i patologii dykhaniya i krovo-
obrashcheniya Instituta normal'noy i patologicheskoy fiziologii
AMN SSSR.

(RESPIRATION)

MARSHAK, M. Ya., prof., otv. red.; MEYERSON, F. S., sam. otv. red.; ARONOVA,
G. N., red.; KRYZHANOVSKIY, G. N., red.; ROZANOVA, L. S., red.;
GOLUBYKH, L. I., red.; BUKOVSKAYA, N. A., tekhn. red.

[Physiology and pathology of the heart] Fiziologiya i pato-
logiya serdtsa; sbornik, posviashchennyi shestidesiatiletiu
deistvitel'nogo chlena AMN SSSR professora V. V. Parina. Moskva,
1963. 310 p. (MIRA 16:9)

1. Akademiya meditsinskikh nauk SSSR, Moscow. 2. Chlen-
korrespondent AMN SSSR (for Marshak).

(HEART)

Iskhak, K. A., et al., 1956, T.S.

Relation between the electrical activity of the respiratory muscles. Fiziol. zhur. 50 no. 8, 1956, p. 1000.

(in Russian)

1. laboratoriya fiziologii i patologii dyshaniya i krovoobrazheniya
Instituta normal'noy i patologicheskoy fiziologii AN SSSR, Leningrad.

MARSHAK, Moisey Yefimovich; FRIEDMAN, A.M., red.

[Physiological bases of hardening the human organism]
Fiziologicheskie osnovy zakalivaniia organizma cheloveka. Leningrad, Meditsina, 1961. 148 p. (MIRA 18:9)

MARSHAK, N.S.

The modern impulse lamp is the most perfected artificial light source for photography. Zhur.nauch.i prikl.fot.i kin. 1 no.5: 362-372 S-O '56. (MLRA 9:11)

1. Moskovskiy elektrolampovyy zavod.
(Photography, Flashlight)

MARSHAK, R. I.

1. MARSHAK, R. I.

001/002

2. MARSHAK, R. I. (1918-1984) - U.S. 100,000,000.

3. MARSHAK, R. I. (1918-1984) - U.S. 100,000,000. V
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100,000,000. (1918-1984) - U.S. 100,000,000. V

4. MARSHAK, R. I. (1918-1984) - U.S. 100,000,000. V
100,000,000. (1918-1984) - U.S. 100,000,000. V

5. MARSHAK, R. I. (1918-1984) - U.S. 100,000,000. V

6. MARSHAK, R. I. (1918-1984) - U.S. 100,000,000. V

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8. MARSHAK, R. I. (1918-1984) - U.S. 100,000,000. V

9. MARSHAK, R. I. (1918-1984) - U.S. 100,000,000. V

10. MARSHAK, R. I. (1918-1984) - U.S. 100,000,000. V

Ninth International Conference (Cont.)

807/5982

(14)

nucleons, their structure, weak and strong interactions, scattering, and their decay. No personalities are mentioned. References accompany individual articles.

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Ninth International Conference (Cont.)

80W/5982

Discussion

546

Whiteman, A. S. Inhomogeneous Wave Equation in Local
Relativistic Quantum Field Theory

547

Discussion

550

Résumé of Reports Presented for the "New Theoretical
Ideas" Session

551

Discussion

600

Glaser, D. A. Decay of Strange Particles

607

Discussion

625

Marshak, R. I. Modern State of the Weak Interactions Theory

627

Card 7/8

ORSHENKOV, I., inzh.; MARSHAK, S., inzh.

Reducing gear of rear axles of the "Moskvich" automobile. Avt.
transp. 37 no.4:36-38 Ap '59. (MIRA 12:6)
(Automobiles--Transmission devices)

MARSHAK, S., inzh.; SHASHKOVSKIY, G., inzh.

The K-59 carburetor of the "Moskvich-407" automobile. Avt. transp.
37 no.10:45-47 O '59. (MIRA 13:2)
(Automobiles--Engines--Carburetors)

MARSHAK, S.A., inzh.

Expediency of drift mining with use of compressed air. Izv.
vys.ucheb.sav.; gor.zhur. no.10:24-28 '59.
(MIRA 13:5)

1. Moskovskiy gornyy institut.
(Mining engineering) (Compressed air)

MARSHAK, S. A., CAND TECH SCI, "CONSTRUCTION OF HORIZONTAL
workings in the
EXCAVATIONS ~~ON~~ COMPLEX MINING ~~AND~~ GEOLOGICAL CONDITIONS."

MOSCOW, 1961. (MIN OF HIGHER AND SEC SPEC ED RSFSR. SVERD-
LOVSK MINING INST IMENI V. V. VAKHRUSHEV). (KL-DV, 11-61,
221).

-161_

MARSHAK, S.A., inzh.

~~Choice of a plan for freezing during the construction of drifts.~~ Izv.
vys.ucheb.zav.; gor.shur. no.2:36-40 '60. (MIRA 14:5)

1. Moskovskiy gornyy institut.
(Soil freezing) (Tunneling)

MARSHAK, S.A.

Expediency of laying gas pipes in common urban utility conduits. Gor.
khoz.Mosk. 35 no.5:28-30 My '61. (MIRA 14:6)

1. Institut TsNII Podzemshakhtostroy Akademii stroitel'stva i arkhi-
tektury SSSR.

(Moscow—Gas pipes)

SHOR, D.I., dotsent, kand.tekhn.nauk; GERCHIKOVA, M.I., inzh.; MARSHAK, S.A.,
inzh.; SAZHIN, V.S., inzh.

Standardization of the cross section of urban utility conduit
tunnels. Gor. khoz. Mosk. 35 no.11:28-30 N '61. (MIRA 16:7)

1. Tsentral'nyy nauchno-issledovatel'skiy i proyektno-konstruktorskiy
institut podzemnogo shakhtnogo stroitel'stva.
(Underground construction)

MARSHAK, S.A., kand.tekhn.nauk; SHOR, D.I., kand.tekhn.nauk

Assortment of reinforced concrete pipes of large diameter. Vol. 1
san. tekhn. no.10:20-21 0 '64. (MIRA 18:3)

MARSHAK, S.A., kand. tekhn. nauk

Mechanized shield for subway tunneling. Transp. stroi.
15 no.6:56 Je '65. (MIRA 18:12)

AKHMATOV, M.M., inzh.; MARSHAK, S.A., kand. tekhn. nauk

Closed shield tunneling in the construction of sewers. Prom. stroi.
43 no.9:37-40 '65. (MIRA 18:9)

L 35829-66

ACC NR: AP6003749

(A)

SOURCE CODE: UR/0113/65/000/010/0023/
0026

AUTHORS: Marshak, S. F.; Gol'dshteyn, V. M. (Candidate of technical sciences) 26
B

ORG: VNIISTroydormash

TITLE: The stability of single-axle tractors in the turning position

SOURCE: Avtomobil'naya promyshlennost' no. 10, 1965, 23-26.

TOPIC TAGS: tractor, vector, motion stability, coordinate system,
vehicle engineering

ABSTRACT: The tilting of a trailer on level ground relative to a three-dimensional coordinate system is considered (see Fig. 1). The coordinate origin (point O) is at the center of the contact line of the wheels of the tractor. The absolute value of the angular velocity $\omega = \sqrt{\omega_y^2 + \omega_x^2 + \omega_z^2}$.

and the direction cosines $\cos \alpha = \frac{\omega_x}{\omega}$;

$$\cos \beta = \frac{\omega_y}{\omega};$$

$$\cos \gamma = \frac{\omega_z}{\omega}.$$

Card 1/3

UDC: 629.114.2.001.5

L 35000-00

ACC NR: AP6003749

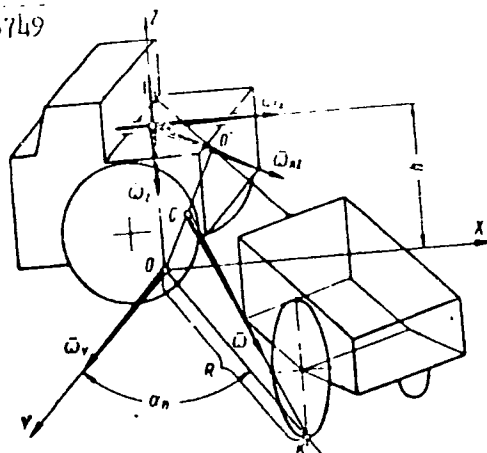


Fig. 1

The expression for the critical slope is found to be a function of six independent variables: the track, the displacement of the coupling from the axle of the tractor, the coordinates of the centers of gravity of the trailer and tractor, the ratio of the weights of the trailer and tractor, and the height of the overall center of gravity of the tractor with trailer. The critical angles for tipping forward and backward, respectively, are:

$$\beta_{QF} = \arctg \frac{d_n(1-K_m) - d_m K_m}{H_c}, \quad \beta_{CF} = \arctg \frac{d'_n(1-K_m) + d'_m K_m}{H_c}$$

Card 2/3

ACC NR: APC00371

Orig. art. has: 1 photograph, 2 diagrams, 1 graph, and 45 formulas.

SUB CODE: 13/ SUBM DATE: none/ ORIG REF: 003

Card 3/3

MARSHAK, Semen Filippovich; SHASHKOVSKIY, Gennadiy Yuvenal'yevich;
GROZOVSKIY, T.S., red.; GORYACHKINA, R.A., tekhn.red.

[Adjustment of the "Moskvich" automobiles] Regulirovka
avtomobilei "Moskvich." Moskva, Avtotransizdat, 1963. 79 p.
(MIRA 17:2)

MARSHAK, S. I.

USSR/Engineering - Refractories, Materials Dec 51

"Chamotte-Chromite Refractory Products," S. I. Marshak, P. K. Busygina, Engineers, Metallurgical Plant imeni Dzerzhinskiy

"Ogneupory" No 12, pp 553, 554

Experimentally establishes possibility of using fine chromite below 0.5 mm in size in production of chamotte refractory products (40% chamotte, 50% clay, 10% chromite dust). Quality of siphon and ladle bricks, and converter tuyeres is improved by addn of chromite to refractory material.

198T22

MARSHAK, S.I.
BCS

Refractories

1375. Fireclay-chrome refractories. —S. I. MARSHAK and P. K. BIRYUKOVA (Oganesov, 14, 553, 1951). Chrome ore of <0.5 mm. fraction can be utilized as a non-plastic component in fireclay steel-casting accessories with a favourable effect on their properties. The batch is 40% prop. 50% fireclay, and 10% chrome dust. The manufacturing process is briefly described. (4 tables.)

BRODSKIY, I.I., inzh.; GNILENKO, B.A.; KRYUKOV, G.Ya.; MARSHAK, V.I.;
KHODAK, I.Z.

Modernisation of a continuous pipe-rolling mill. Mekh.i avtom.
proisv. 14 no.1:24-26 Ja '60. (MIRA 13:5)
(Pipe mills)

RUBO, Leonid Grigor'yevich [deceased]; MANSBAK, Yevsey L'vovich;
UPANTSEV, N.B., red.

[Installation of high-voltage machinery windings, Montazh
obmotok elektricheskikh mashin vysokogo napriazheniya.
Moskva, Energiia, 1961. 45 p. (Biblioteka elektromontera,
no.140) (MIRA 1711.)

MARSHAK, Y. M.

27

Changes in sodium hydrosulfite solutions. Y. M. Marshak. *Khim. Nauka i Prom.* 2, 524-5 (1957).—The decompn. of $\text{Na}_2\text{S}_2\text{O}_4$ in alk. and acid solns. was studied. The following reactions were established by chem. analyses: $3\text{Na}_2\text{S}_2\text{O}_4 + 6\text{NaOH} = 5\text{Na}_2\text{SO}_3 + \text{Na}_2\text{S} + 3\text{H}_2\text{O}$ (I), $2\text{Na}_2\text{S}_2\text{O}_4 + 2\text{NaOH} = \text{Na}_2\text{S}_2\text{O}_3 + 2\text{Na}_2\text{SO}_3$ (II), and $2\text{Na}_2\text{S}_2\text{O}_4 + \text{H}_2\text{O} = \text{Na}_2\text{S}_2\text{O}_3 + 2\text{NaHSO}_3$ (IIa). To det. the product of initial decompn., $\text{Na}_2\text{S}_2\text{O}_4$ was added slowly to boiling HCl (5-6N). The following reaction took place: $3\text{H}_2\text{S}_2\text{O}_4 = 5\text{SO}_2 + \text{H}_2\text{S} + 2\text{H}_2\text{O}$ (III). $\text{H}_2\text{S}_2\text{O}_4$ could not be an intermediate product because products of its decompn. are H_2SO_3 and H_2S (cf. Foerster, *et al.*, *C.A.* 28, 4673'). The products of decompn. of $\text{H}_2\text{S}_2\text{O}_4$ in cold HCl were, after neutralization with NaOH , salts $\text{H}_2\text{S}_2\text{O}_3$ and H_2SO_3 , whereas when similarly neutralized in the presence of formalin, the products contained sulfoxylate, and H_2SO_3 could not be detected, presumably because of the reaction $\text{H}_2\text{S}_2\text{O}_3 = \text{H}_2\text{SO}_3 + \text{SO}_2$ (IV). Apparently, in the absence of formalin $2\text{H}_2\text{S}_2\text{O}_3 = \text{H}_2\text{S}_2\text{O}_4 + \text{H}_2\text{O}$ (V). The sum of IV and V accounts for the reactions II and IIa. In an alk. medium the initial stage of decompn. is $\text{Na}_2\text{S}_2\text{O}_4 + 2\text{NaOH} = \text{Na}_2\text{SO}_3 + \text{Na}_2\text{SO}_3 + \text{H}_2\text{O}$ (VI). In the presence of rongulite, the reaction in boiling HCl is $3\text{H}_2\text{S}_2\text{O}_4 = 2\text{SO}_2 + \text{H}_2\text{S} + 2\text{H}_2\text{O}$ (VII), which is similar to the reaction in hot alk. rongulite solns.: $3\text{NaHSO}_3 + 3\text{NaOH} = 2\text{Na}_2\text{SO}_3 + \text{Na}_2\text{S} + 3\text{H}_2\text{O}$ (VIII). The sum of reactions IV, VI and VII or VIII explains reactions I and III. Heating the acid rongulite soln. decompd. about 60% of the H_2SO_3 to form S and SO_2 .
Distr: 484j

E. M. MARSHAK

$2\text{H}_2\text{SO}_4 = \text{SO}_2 + \text{S} + 2\text{H}_2\text{O}$ (VIII) and the rest (10%) decomp. by reaction V. Under similar conditions, $2\text{H}_2\text{S}_2\text{O}_8 = 3\text{SO}_2 + \text{S} + 2\text{H}_2\text{O}$, identical with VIII. Apparently the entire process of decompn. of $\text{H}_2\text{S}_2\text{O}_8$ is based on the intermediate compd. H_2SO_5 which decomp. by reaction V, VII, or VIII. It was postulated that one mol. of H_2SO_5 oxidizes another mol.: $\text{S}(\text{OH})_2 + \text{HS}(\text{OH})_2\text{O} = \text{HS-OH} + \text{H}_2\text{SO}_4$. The active intermediate "thioperoxide," HS-OH , decompd. to give either S or O, accounting for the formation of H_2SO_4 or H_2S . Reactions I, III, VII, VIII, and VIII have not been published before. I, Benecowitz 2/2

[Handwritten signature]

GRINBERG, A.A.; MARSHAK, Ye.M.; LYBOMIROVA, E.L.

Reaction of potassium chloroplatinate with norgalite. In: J.
neorg. khim. 10 no.3:177-178, 1965. XIII, 1-2.

ACC NR: AT7002114

(A)

SOURCE CODE: UR/0000/66/000/000/0295/0304

AUTHOR: Marshak, Yu. I.; Savost'yanov, V. N.; Khesin, G. L.; Shvey, Ye. M.

ORG: none

TITLE: Simulation of thermal stresses in structural engineering

SOURCE: Vsesoyuznaya konferentsiya po polarizatsionno-opticheskemu metodu issledovaniya napryazheniy. 5th, Leningrad, 1964. Polarizatsionno-opticheskiy metod issledovaniya napryazheniy (Polarizing-optical method of investigating stresses); trudy konferentsii. Leningrad, Izd-vo Leningr. univ., 1966, 295-304

TOPIC TAGS: stress analysis, thermal stress, structural engineering, temperature measurement, thermocouple

ABSTRACT: This paper deals with an investigation of stresses in building structures and structural elements subjected to effects of stationary and quasi-stationary thermal fields. Two methods were employed: 1) models subjected to "freezing" and "unfreezing" of deformations, and 2) models exposed to a simulated temperature field, approximating one occurring under real conditions. The wide application of the "freezing" and "unfreezing" techniques, combined with their further development, allowed the transition from the solution of relatively simple problems to solution of complex two- and three-dimensional problems. Based on experimental data, obtained from

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ACC NR: AT7002114

"unheated" models, a method for construction of graphs of stress fields due to "unit" thermal effects in nondimensional coordinate systems was developed for the class of problems that can be reduced to a plane, or a ring (having a central aperture of any complex shape) to which an axisymmetrical thermal field is applied. Using these graphs, constructed on the basis of a limited number of experiments, by means of a simple computation, the stresses (or stress concentration coefficients for the characteristic points) in the structures of the shape used for the development of the graphs can be determined for the effects of an arbitrary axisymmetrical thermal field. The method is illustrated by the analyses of the stresses in a ring with a central aperture, and a thin-walled building structure. In the first case, an axisymmetric thermal field was applied; in the second case, a large temperature gradient was assumed to exist. A scale model of the structure was built of epoxy resin plates. In conclusion, a method for displaying a temperature field on an oscilloscope is described. The temperatures in the various points of the models were measured by thermocouples connected through a scanning rotary switch to the Y input of the scope. The sweep was generated in a conventional manner by connecting the X input to a variable voltage divider operated synchronously with the scanning switch. Orig. art. has: 6 figures, 8 formulas.

SUB CODE: 20,13/

SUBM DATE: 14Jun66/

ORIG REF: 005

Card 2/2

MARKSHAK, U. L.

1A 1144

USSR/Furnaces

Mar 1947

"Investigation of Molten-Slag Precipitation in an
Experimental Furnace," U L Markshak, 8 pp

"Izv Vses Teplotekh Inst" No 3

On the basis of these experiments a design is recom-
mended for an industrial furnace with maximum
slag-precipitation.

1T44

MARSHAK, YU. I.

Oct 1947

USSR/Engineering
Boilers
Coal

"Thermal Work of Boiler Units in Burning Pulverized High Ash Lignite Coal," Yu. I. Marshak, V. P. Romadin, S. A. Tager, Candidates in Technical Sciences, Heating Laboratory, 7 PP

"Is VTI" No 10

An analysis of the thermal work of a boiler unit supplied by a spherical tumbling barrel in burning pulverized high-ash lignite coal, on the basis of experimental data.

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<p>252. INVESTIGATION OF THE COLLECTION OF LIQUID SLAG IN AN EXPERIMENTAL FURNACE. Marshak, U.-L. (Izvestiya Vsesoyuznogo Teplostechn. Inst., 1947, 16, (5), 18-26; Engng. Dig., Sept. 1947, 8, (9), 298-300). An investigation into the separation of liquid slag from the furnace gases was carried out with the employment of the model of an L-shaped combustion chamber, this furnace being capable of burning 10 kg. of powdered coal per hour. The test results are discussed and conclusions drawn. An evaluation of the test results allows the establishment of certain fundamental principles governing the slag collecting efficiency of full-size furnaces. (1) The retention of liquid slag on the walls of the combustion chamber is due to the mobility of the slag droplets under the influence of the turbulence of the flame. If turbulence is absent, then the remedy will lie in considerably increasing the length/diameter ratio of the furnace. According to Prof.</p>																																																																																																																																																																																																											
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Remain the theoretical relationship between the slag collecting efficiency η_m and the length/diameter ratio of the furnace can be expressed by

$$\eta_m = 1 - e^{-\frac{4\omega}{\omega_g \omega_g} \cdot \frac{L}{D}}$$

where ω is the mass velocity of the gases in kg/sq.m. per second, ω_g is the flame speed in m. per second, ω_g is the weight of gas in kg./cu.m. (2) The retention of slag particles by the slag bottom will be the larger the greater the centrifugal effect produced by the change in the direction of flame travel. For this reason the flame velocity at the point where the flame approaches the slag bottom should be made as large as possible. On the other hand, the distance between furnace throat and liquid slag level should be as small as possible.

KUVAYEV, YU. P., LYAKH, V. YA., MARSHAK, YU. L.

Steam Boilers

Deformation of a laminated air preheater at increased drop of air and gas pressure.

Elek. sta. 23 no. 4 (1952)

Kond. Tekhn. nauk

SO: Monthly List of Russian Accessions, Library of Congress, August 1952, Uncl.

MARSHAK, Yu. L.

✓ 830. PROSPECTS FOR FURNACES WITH LIQUID SLAG REMOVAL. Marshak, Yu. L. and Ramedin, V.P. (Elektr. Stn. (For Stn., Moscow), Dec. 1953, vol. 21, 3-8). Many industrial furnaces in Russia fired with various types of coal are being operated with maximum slag removal. Greater purity of the gases and the possibility of at least doubling the chemical loading in the combustion chamber by removing slag from the heating surface indicate the advantage of using furnaces with maximum slag removal in 230 and 450 tons/h boilers. The liquid slag may be used for technological purposes and the slag heat for air heating up to 400-600°C. A chart shows the specific power consumption for internal needs in furnaces equipped for liquid and dry slag removal. B.E.H.

Cond. Tech. Sci

1. KUVAYEV, Yu.F.; MARSHAK, Yu.L.
2. USSR (600)
4. Furnaces
7. Equipment for combustion chambers, operating at a higher than atmospheric pressure, Eng. Yu.F. Kuvayev, Yu.L. Marshak, Izvestia. 24 no. 3, 1953.
9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953, Incl.

KUVAYEV, Yu.F., inzhener; MARSHAK, Yu.L., kandidat tekhnicheskikh nauk.

Experience in the manufacture of fin tube walls. Elek.sta. 24 no.7:44-45
Л '53.

(MLBA 6:7)

(Furnaces)

MARSHAK, Yu.L., kandidat tekhnicheskikh nauk; SHAPOROV, D.V.,
inventor:

Starting and operating a furnace with a maximum catch of ashes
designed by the All-Union Heat Engineering Institute. Elek. sta.
24 no.12:9-15 D '53. (MLRA 6:12)
(Furnaces)

MARSHAK, Y. L. Master of Science and ROMADIN, V. P. Dr. Tech. Sci.

"Furnaces with a High Slag Collection in Vertical Cyclones," paper presented
at the 5th World Power Conference, Vienna, 1956

In Branch #5

E-2014

MARSAK, Yu. L.

5358. URAL CONFERENCE ON DEVELOPMENT OF METHODS FOR THE COMBUSTION OF
FUEL IN BOILER PLANTS AND IMPROVEMENT OF FUEL PULVERIZATION. Marshak, Yu. L.
et al. (Molotov: Molotovskoe knizhnoe izdatel'stvo, 1956, 235pp.; abstr.
in Teploenergetika (Heat Pwr. Engng), Jan. 1957, 6). 16 papers are included.

Marshak Yu. L.
 3498. COMBUSTION OF MIDDINGS FROM PREPARATION OF KIZEL COAL IN A VTI
 FURNACE WITH HIGH SLAG TRAPPING. Marshak, Yu. L. (Toploenergetika (Heat
 Engng, Moscow), Dec. 1956, 28-34). Test results are given. The
 maximum steaming capacity of the boiler was 250 tons/h and the fuel contained 40%
 ash. These were four vertical cyclone furnaces 1.96 m in diameter and 11 m
 high, two each side of the boiler. There was a screen of boiler tubes to trap
 the slag in the horizontal duct which joined the bottom of each cyclone furnace
 to the main chamber. (L).

All-Union Heat-Engng. Inst

PERIODICAL ABSTRACTS

Sub.: USSR/Engineering

AID 4166 - P

MARSHAK, YU. L.

IZUCHENIYE TOPKI VTI S VYSOKIM SHLAKOULAVLIVANIYEM NA KIZELOVSKOM
UGLE (Research on the VTI furnace with high slag interception
for Kizel coal). Teploenergetika, no. 2, P 1956: 12-20.

The results of tests and the performance of the VTI stoker using
coarse Kizel coal dust are presented. It is suggested the data
obtained be used in computing and designing stokers for hard coal.
Ten diagrams.

See also 12-20, 12-20, 12-20

MARSHAK Y.D.L.

✓ 555. BLADED BURNERS FOR VTI PRELIMINARY COMBUSTION CHAMBERS. Marshak, Y.D.L. (Teploenergetika (Heat Pwr Engng, Moscow), Sept, 1957, 40-45). An illustrated account is given of experiments with models and actual pulverized-fuel burners. The fuel-air mixture, and the secondary air, pass through turbulizer blades at their exits from the burners instead of entering through spiral channels. (L).

MARSHAK, Yu.L., kandidat tekhnicheskikh nauk.

Blade burners for VTI pre-furnaces. Teploenergetika 4 no.9:40-45
S '57. (MLRA 10:8)

1. Vsesoyuznyy teplo tekhnicheskiiy institut.
(Burners)

PHASE I BOOK EXPLOITATION

SOV/3732

Marshak, Yu.L., and V.P. Romadin

Topki VTI s vysokim shlakoulavlivaniyem (VTI [All-Union Heat-Engineering Institute] Furnaces With High-Efficiency Slag Removal) Moscow, Gosenergoizdat, 1958. 95 p. (Series: Iz opyta sovetskoy energetiki) 4,300 copies printed.

Sponsoring Agencies: Gosudarstvennyy trest po organizatsii i ratsionalizatsii rayonnykh elektricheskikh stantsii i setey.

Ed.: N.G. Stratonov, Engineer; **Ed. of Publishing House:** Ye.I. Radzyukevich; **Tech. Ed.:** N.I. Borunov.

PURPOSE: This book is intended for engineers concerned with the design and construction of boiler furnaces.

COVERAGE: This is a description of the design, construction, operation and characteristics of boiler furnaces with high-efficiency slag removal designed by VTI (All-Union Heat-Engineering Institute). These furnaces are equipped with cyclone-type precombustion chambers, in which the main part of the fuel is burned and the liquid slag separated, and a
Card 1/4

VTI [All-Union Heat-Engineering Institute] (Cont.)

SOV/3732

common gas-cooling chamber. The separate combustion and ash-melting chambers provide for a simpler arrangement of screens in the second chamber and more efficient cooling of gas. Greater flexibility is afforded in controlling the furnace without disturbing the removal of slag. The furnaces are characterized by greater efficiency in removing liquid slag, more effective combustion of coke residues, greater capacity for burning coarse particles and a higher degree of heat absorption in the precombustion and cooling chambers. The following organizations and persons participated in the work of designing, constructing, operating and testing boiler installations with VTI furnaces: Division Chief A.N. Lebedev, Senior Technician T.L. Grishchko, Senior Engineers V.M. Kondakov (Deceased), V.V. Solov'yev and V.Ye. Maslov, and Junior Scientific Workers Yu.P. Kuvayev, and I.O. Volkov from the Furnace Division of the All-Union Heat-Engineering Institute; Unit Chief B.A. Lindkvist, Senior Engineers M.A. Zav'yalov, K.M. Postnikov, and Yu.A. Zorin, head of the Planning and Design Office N.P. Rysakov, and Construction Site Chief K.M. Livinskiy of Uralenergomon-tazh (Ural Trust for the Assembly of Power Installations); Chief Engineer D.V. Shoporov, V.Ya. Lyakh, Boiler Shop Chief P.P. Volkov, Senior Foreman G.P. Popov of the Zakamskaya TETs. (Zakamsk Heat and Electric Power Plant); Unit Chief E.M. Livshits, V.M. Biman, Ye.M. Zalkind, Group Engineer Yu. P. Khar'kin, Senior Engineer P.M. Kolabukhov, Engineer N.V. Khor'kov

Card 2/4

VTI [All-Union Heat-Engineering Institute](Cont.) SOV/3732

and V.V. Nechayev from Orgenergostroy (All-Union Institute for Planning and Designing Power Plant Construction); Chief Engineer I.M. Shamrayevskiy, Unit Chief A.A. Parshin, and the head of the Special Design Office V.S. Potychko of the Taganrogskiy kotlostroitel'nyy zavod (Taganrog Boiler Plant). There are 35 references: 30 Soviet, 3 German and 2 English.

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Card 4/4

JA/edw/mh
7-18-60

SOV/96-58-6-13/24

AUTHORS: Maslov, V.Ye., Engineer and Marshak, Yu.L., Cand.Tech.Sci.

TITLE: An investigation of the separation of solid suspended particles on to a liquid film with a swirling gas flow. (Issledovaniye separatsii tverdykhvzveshennykh chastits na plenku zhidkosti pri vikhrevom dvizhenii potoka).

PERIODICAL: Teploenergetika, 1958, No.6. pp. 63 - 70. (USSR)

ABSTRACT: It is difficult to study the way that slag is separated and trapped in cyclone furnaces under normal operating conditions. Accordingly, it is of interest to study cold models in which the liquid slag surface is represented by a film of viscous liquid and the drops of liquid slag by solid particles in suspension. Tests in the cold are, however, not entirely representative because of the effects of combustion on the aerodynamics of the process. This work attempts a more careful study of the separation of suspended particles from a swirling flow on to a film of viscous liquid, applying the theory of similarity. The equipment used in the experiments was a horizontal section of tube, fitted with various measuring instruments and attached to the discharge side of a fan. The various separator models shown in fig.1. were connected to the open end of the tube. The inside of the models was lined with cloth coated with vaseline. The dusty-particles, obtained by winnowing, were fed into the inlet tube at a suitable distance from

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the inlet to the model. The dust consisted of crystals of $K_2Cr_2O_7$ with a specific gravity of $2.69 \times 10^3 \text{ kg/m}^3$. There is not complete agreement about the criteria that govern the separation of dust in cyclones. Some consider that when the resistance of the particles follows Stokes' law, the governing criteria are those of Stokes and Froude; others consider that the process of separation is governed only by the Stokes criterion. A special study of this point was accordingly made. A number of effects that occur in dry cyclones were absent, because once a particle of dust touched the sticky wall it was trapped. The tests were made on geometrically similar models installed vertically with tangential flow inlet as shown in fig.1. The diameter of the models ranged from 50 to 400 mm, and the length was four diameters. Separation was improved by increasing the size of particles and the rate of flow, and by decreasing the diameter of the model. The results are plotted as functions of Stokes' criterion in fig.2., and it is shown that this criterion is the governing one.

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Change in Froude's criterion over very wide limits has no influence on the process of separation. A plot of the change in the coefficient of dust distribution along the length of the chamber with tangential inlet is given in fig.3. Most of the dust is deposited in the first section of the chamber, and the character of the curves alters very little with changes in the Stokes' criterion. In an actual cyclone, combustion reduces the swirling of the flow. To study the effect of changes in swirl upon dust separation, tests were made in a cylindrical chamber 100 mm diameter and 400 mm long, with various swirlers having blades set at different angles. The resultant relationship between the degree of separation and Stokes' criterion is plotted in fig.4. The change in degree of separation along the length of the chambers with bladed swirlers is plotted in fig.5, which shows that if the swirl of the flow is increased more dust is deposited in the early stages. It follows that to get good separation in short chambers, good swirling is required, and that if the chamber is long the reduction in swirl that results from combustion will be less damaging than if the chamber is short. To study the influence of the shape of the chamber, tests were made with cylindrical chambers having various ratios of chamber to swirler diameter, and on square and rectangular chambers. The same swirler

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was used in all tests. The results are plotted in figs. 4 and 5. The transition from round to square to rectangular shape reduces the separation of dust, the effect being most marked in long chambers. Reduction in the diameter of the swirl relative to that of the separator reduced the separation, particularly in long chambers. Analysis of the experimental data yields a generalised relationship that may be used to determine the degree of separation of dust in variously-proportioned chambers with bladed swirlers with various amounts of swirl. Tests were made on a 1/5 - scale model geometrically similar to a cyclone pre-furnace of the All Union Thermotechnical Institute. The three burner arrangements depicted in fig.7. were used. The graphs in fig.8. show the relationship between the total degree of separation and the flow of air in the chamber. Dust is trapped best when all the air is passed through the bladed burner, and worst when 80% of the air passed through the tangential nozzle and the rest through the bladed burner. Thus, it may be supposed that with an equipment of given resistance to flow, the best burner arrangement, when the fuel is

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of high volatiles content, is one in which all the fuel dust and air are passed through the bladed burner. When the fuel is of low volatiles content, ash is best removed by a construction in which only the fuel/air suspension is passed through the bladed burner and the rest is passed through the tangential nozzle. This improves the combustion conditions by increasing the time that the fuel particles are in the pre-furnace before reaching the walls. There are 8 figures and 15 literature references (11 Soviet, 2 German and 2 English)

ASSOCIATION: All Union Thermotechnical Institute. (Vsesoyuznyy Teploekhnicheskii Institut)

1. Slags--Separation
2. Gas flow--Applications

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SOV/94-50-11-4/21

AUTHOR: Marshak, Yu.L., Candidate of Technical Science

TITLE: A Study of Heat Exchange in Vertical Cyclone
Combustion Chambers (Izucheniye teploobmena
v tsiklonnykh vertikal'nykh predtopkakh)

PERIODICAL: Teploenergetika 1958, Nr 11, pp 20-25 (USSR)

Little has been published on heat-exchange calculations in cyclone furnaces with overhead slag removal. The use of data obtained on other types of furnace burning other fuel can give rise to serious errors. This article uses for calculations on vertical cyclone furnaces, experimental data obtained during the combustion of various fuels in a furnace with overhead slag removal installed at the Zakamsk Heat and Electric Power Station under a boiler of output 250 tons/hr at 30 at and 420°C. The furnace arrangements are described; there were four vertical cyclones formed of pipe 83/5 mm diameter. The fuel characteristics are given in Table 1. The test procedure has been described previously in

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Teploenergetika 1956, Nr 2 and Nr 12. The quantity

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of heat absorbed in the cyclone was determined by the heat balance of the combustion products. The process of heat exchange in cyclone furnaces is discussed and an expression given for the heat flow through the screen. The factors governing the thermal conductivity of the slag and the thickness of the slag coating are discussed. A feature of the vertical cyclones of the All-Union Thermo-Technical Institute is the non-uniform distribution of heat flow along the height of the cyclone because of the variable thickness of the slag coverings. Graphs to illustrate this point are given in Fig.1. The ash content of the fuel affects the heat absorption of the screen as indicated graphically in Fig.2. The heat absorption of the screens is also influenced by the melting point of the slag in the manner plotted in Fig.3. Other graphs relating to furnace conditions are given in Fig.4 and an analysis of the curves shows that the

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adiabatic temperature governs the actual temperature level in the cyclone. These graphs also show that as the ash content of the fuel rises from 9 to 12%, the adiabatic temperature remains unchanged whereas the temperature level in the cyclone increases somewhat. For each of the fuels investigated a relationship was obtained between the heat flows and the adiabatic combustion temperatures: it depended on the ash content of the fuel and the melting point of the slag as indicated by Fig.5. The influence of air-flow conditions on heat exchange is explained. By analysis of the test results a generalised relationship is obtained between the Boltzmann number and the dimensionless temperature beyond the cyclone; a graph of this relationship is given in Fig.6, constructed from equation 5. The accuracy with which this formula satisfies the experimental data is made clear from Table 2. The formulae

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given can be used for heat-exchange calculations in
vertical cyclone combustion chambers of the All-Union
Thermo-Technical Institute type. There are 6 figures,
2 tables and 5 literature references all of which are
Soviet.

ASSOCIATION: Vsesoyuznyy teplo tekhnicheskiy institut (All-Union
Thermo-Technical Institute)

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MARSHAK, Yu.L.

Determining the smallest efficient dimensions for cyclone furnaces. Nauch.dokl.vys.shkoly; energ. no.1:215-219 '59.
(MIRA 12:5)

1. Teplotekhnicheskiy nauchno-issledovatel'skiy institut im.
F.E. Dzerzhinskogo.
(Furnaces)

SOV/96-59-12-10/90

AUTHORS: Marshak, Yu. L., Candidate of Technical Sciences, and
Maslov, V. Ye., Engineer

TITLE: The Arresting of Suspended Particles Flowing Isothermally
Through a Bundle of Tubes Coated with Viscous Fluid

PERIODICAL: Teploenergetika, 1959, Nr 12, pp 55-62 (USSR)

ABSTRACT: Published data on the separation of suspended particles
in a flow of gas by a bundle of tubes are not very
suitable for design purposes. Tests were accordingly
made to study the influence of tube bundle geometry,
rate of gas flow, particle size distribution and other
factors on the process of ash-arresting. The tests were
made in a vertical duct of 100 x 100 mm containing model
tube bundles and connected to an extraction fan. The
tubes were smeared with petrolatum to represent molten
slag. The dust used was potassium bichromate, and the
quantity trapped was determined by iodometric methods
of analysis. The various models of bundles of tubes
that were tested are shown in Fig 1. In the main test
the tubes were 5 mm diameter, which is about 1/20th of
the diameter used in practice. The efficiency of
arresting was evaluated by Eq (2) which is in terms of

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the ratio of the quantity of material trapped to the average content of the material in the flow at inlet to the bundle. The tests made with different constructions of tube bundles were carried out with dust of 12 to 18 microns at a rate of flow of 16 m/sec. The distribution of the effectiveness of dust-arresting by tubes in different rows is plotted in Fig 2. The second row of tubes was always the most effective because of the local increase in the particle content of the flow immediately ahead of them. The increase was due to the passage of the flow over the first row. In general, the second, third and presumably successive rows are approximately as effective as the first one. In order to determine the influence of the main physical factors on the process of dust separation, tests were made with the first model. It had three bundles, each comprising four rows of tubes; the rates of flow ranged from 2 to 30 metres per second, with particle sizes ranging from 0 - 12 to 75 - 90 microns, and tube diameters of 5 and 10 mm. Test results obtained at various rates

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